
HARDCOPY

Produced Jointly by LVAUG and ABE's ACEs
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This newsletter is published by LVAUG and ABE's ACEs on a bi-monthly basis (six issues per year). Opinions expressed in this newsletter are those of the author and not LVAUG/ABE's ACEs. All unsigned articles should be attributed to the Editors. This newsletter is provided free to our membership and on an exchange basis to other user groups. Original articles from our newsletters may be reprinted in other newsletters, provided credit be given to both author and source.

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Edward Bachman
James D. Craig

Paul Grover
Jonathan Mordosky

Thank You,
Bernie Blasko, John Dashner, and Jace Gill - The Editors

ABE's ACEs

Allentown Bethlehem Easton's Atari Computer Enthusiasts is an independent user group organized and run by owners of Atari Computers. Atari is a trademark of Atari Corp. - all references should be so noted.

If you would like more information about ABE's ACEs, write us at the club's address or call the club HOTLINE listed on the last page.

ABE's ACEs meets the second Saturday of every month at 1:15 P.M. at the:

Northampton County Area Community College
(NCACC) - Keystone Classrooms 217/218

LVAUG

Lehigh Valley Atari Users Group
P.O. Box 1307
Allentown, PA 18105-1307

Meets the first Thursday of every month at 7:30 P.M. at the:

Lincoln Technical Institute
5151 Tilghman St.
Allentown, PA 18105

* A TRIP TO ATARIFEST '89 *

By: Jonathan Mordosky (LVAUG/ABE's ACEs)

For the past few years, I have read about several Atarifests being held in the Washington, D.C. area. It is an annual two day event and features some of the biggest names in the Atari community. I was tired of just reading about it. I was going. On Saturday October 7, and after about 4 and a half hours of driving, I arrived at Fairfax High School in Virginia. Being somewhat early, I joined the crowd waiting to get in.

I soon ran into some familiar faces from Pennsylvania and we started talking Atari. Time went quickly. At ten o'clock we were let in. The Atarifest was spread throughout the High School. Most of vendors were divided between two areas. In the main area were some of the big names, like: Atari, I.C.D., Michtron, Orion, Alpha, and many others. In another hall were vendors that couldn't fit in the main exhibition area. Along a main hallway were tables setup for user groups selling club disks and signing up new members. Classrooms were setup as areas of special interest being sponsored by user groups and companies. Every hour featured a different seminar by respected speakers. The atmosphere was casual, with people wanting to answer questions and help. If you were looking for a bargain, there were show specials by most vendors and a swap meet room for used equipment, books, and software.

The main speaker of the show was Sig Hartmann, Vice President of Atari Corporation. He spoke about Atari in the U.S. and other countries. He talked about real products and future ones. He talked about advertising, distribution, marketing, power without the price, a lean running company and next year. He had much to say about new products. After his talk, there was a question and answer period. Bob Broddie, the new Atari user group coordinator, answered some and Sig answered others.

The Lynx is a hand-held color portable game machine. It is currently in production and should be in the stores within a month or two. Atari will continue to support the 8-bit as long as they continue to sell. The biggest problem with this market is that most software developers no longer support it. Atari has tried many things to change this, with little success. Atari's latest product for the 8-bit computers is Atariwriter80.

Things look better for the 16 bit market. The new ST portable, STacy, should be out by the end of this year. It failed its first FCC test and has been revised; it's, now, undergoing the process again. Atari has sent 250 C.D. Rom drives to developers and, as soon as there is software to support it, this product will be released. There is a new enhanced ST in development. It is called the STE. It will feature stereo sound, enhanced colors and graphics, and GEM lock. Sig stated the ST's and Mega's are Atari's "Prime Product," and it will continue to support them in the future.

The Portfolio is a real product which you can buy today. It is a small hand held MS-DOS compatible computer. It is based on a 80C88 microprocessor running at 4.9152 Mhz. It has 256K of ROM and 128K of RAM for program space. There are several built in applications, including: a spreadsheet, database, phone dialer with a directory, DOS, and a text editor. It features a 40 column by 8 line screen and is about the size of a VCR tape. It uses standard AA batteries which should last about 6 to 8 weeks under normal use.

Atari has shown it's TT computer in Europe and has a US version in development. It is based on a 32 bit 68030 microprocessor. It features higher resolution graphics and faster CPU speeds. It will run both Unix and TOS 1.4 as operating systems. All ST programs which followed Atari's guidelines should work with the new machine.

Atari brought some new hardware products to the Atarifest. There were Atari 30 and 60 meg. hard drives. There was the Atari MegaFile44 removable cartridge hard disk. There were lots of Mega 2 and 4 computers and Laser printers. There was the new Portfolio. And back in the MAC emulation room was a STacy 4, with 4 meg. of memory and a internal 40 meg. hard drive.

The third party developers were there too. There were several companies showing their MIDI products for the 8-bit and ST. I.C.D. has a new super fast tape back-up system. It works at 6.5 megabytes per minute. It can store 155MBs of data on a single data cassette. Toad Computers was showing off the new Toadfile 44. It is a removable cartridge hard drive system. It is very fast with an access time under 30 msec. and 44 meg. of storage on each removable cartridge. Gadgets By Small was there with their just released Spectre GCR Macintosh Plus emulator and software. It can read and write Mac disks with an Atari Disk Drive. Orion Micro Systems was showing their BBS Professional and Express communication programs for the 8-bit. Several magazines had reserved tables, including: ZMAG, Atari Interface, STatus, ST-Log, ST Report, and ST Informer. There were many other vendors and companies showing and selling their products.

I was at the Atarifest from opening 'til closing on Saturday. I found one day wasn't enough for me. There were many times I wanted to be in more than one place at a time. The turnout for the Fest was less than many expected and some were disappointed with it. I enjoyed getting a chance to talk to developers and only a short wait to get at most tables. The attitude of most people at the fest was upbeat. After several years of Atari doing little in the USA market, they appear ready to make another move. I believe most Atari owners would agree. It's about time!

*** BEGINNER'S COLUMN ***

Synfile: The Only Database You'll Ever Need!

By: John W. Dashner (LVAUG)

Synfile is a powerful 8 bit database for storing and retrieving information. It was released by Synapse software and, later, acquired by Broderbund software.

On the original release, you could find a tutorial on the reverse side of the disk which was very helpful in getting you started with the setup of your own database. However, when the 130XE's were released, the tutorial was eliminated in favor of the XL/XE versions. If you used Synfile on the older 800's, you needed the translator disk to boot Synfile. Synfile is a complete menu driven program, with prompts at the top and bottom of the screen; this eliminates guessing.

Once you get acquainted with Synfile, you can do away with almost every other database, mailing list, reminder list, or collection/inventory program that you have.

Listed below are some of the files which you can custom make on your own:

- * MAILING LIST - Select your format and print out all or a selected group of labels.
- * HOME INVENTORY - Make this file any way you wish; list where hidden ID numbers are, values, etc. Print out the whole list or just one room, and have the values total up automatically.
- * COIN, STAMP, or any COLLECTIBLE - Set up fields to compute a selling price guide, based on present value entered; compute earnings ratios, etc.
- * MONTHLY MEETINGS OR REMINDERS - Print the month you want and the data you want on the printout.
- * LIABILITY/TAX - Track your monthly bills and income tax deductions; one printout at the end of the year will have your Income tax deductions ready for filing.
- * LIBRARY - Format your books, record albums, audio and video tapes, etc. any way you wish.
- * VEHICLE - Track you repair, service records, and expenses; a print out of this will tell you exactly what you spent on your vehicle from day one to present.
- * CATEGORIZE - Do this for icons or pictures to ease the search for certain ones (I even rate Musikfest performances by comparing past records from a printout and, then, I decide which acts I wish to see in the upcoming year).

This list is endless, but remember: by loading one program, you can access all the above and more, and just by pressing a few keys.

It's too bad you cannot put this on a hard disk; you wouldn't have to switch disks.

When you create a file, you are actually creating four different files:

- * TBL - Table file; a description of database form. Contains all the fields, formulas, etc.
- * CNF - Number of records, disks, index fields, current record number, etc.
- * IDX - Index data. You should name the fields, on which you are going to search, as index fields; it will search faster.
- * DXX - (XX = disk number). Actual data is stored in this file.

Synfile is compatible with Syncalc, Syntrend, and Atariwriter.

Once your database is set up, you can change or add fields without loosing or re-entering data. All you have to do is merge the old file into the new.

You can create subfiles by selecting desired records and storing them in the separate subfile. You can tell the program how you want the file to be printed and which records you want listed on that file. You can do a screen dump of a record as shown on the screen.

Once you have records stored in a file, make at least one backup copy of the file, in case you accidentally mess up the original; especially, while you are getting accustomed to the program and its options. And, make sure you close the file after each use or you may lose, or completely destroy the file. If a disk gets full, make sure you follow the instructions that appear on the screen or, again, you can lose all your data.

Synfile is capable of.....

- * Up to 66 fields per record.
- * Up to 16 disks per file.
- * Up to 16 sort files.
- * Up to 16 search fields.
- * Records per file are limited by Ram and Index length.
- * Form size - 80 characters x 21 lines including field names of up to 31 characters.

Hopefully, next issue, I'll be ready to do a review of SFP - a new Synfile utility program, recently released by Donald R. Seay. I must, first, get accustomed to using it, though.

Note: Atari is a trademark of Atari Corporation. Broderbund, Synapse, and Synfile+ are trademarks of Broderbund/Synapse. SFP is copyrighted by D. R. Seay.

* ATARITECH BBS! XE CONSOLE KEY FIX *

Courtesy of CompuServe Atari8

By: The Traveler (LVAUG)

The Atari 130XE is one of the BEST 8-bit computers available today. But as with all computers, it does have a few small "warts." One of these is the keyboard itself; the console keys, in particular.

The type of keyboard used is known as a "low-resistance contact," the resistance being about 1000 ohms or so. As you use the keyboard, the resistance of the contacts tends to go up. For the regular keyboard and the RESET key, this increase in resistance causes no problems. But the console keys (OPTION, SELECT, and START) are read by a different IC, and the change in resistance will eventually keep the console keys from working (the HELP key is actually read as just another letter key).

The fix to the problem is to add just enough resistance in parallel to the key that is high enough not to make the computer read the key as pressed, but low enough so that when the console key is pressed, the computer will recognize it.

The original idea for this fix came from Alan Haskell from the book "Mods, Fixes, and Upgrades" available from Best Electronics, 2021 The Alameda, Suite 290, San Jose, CA 95126. One minor problem with the fix, however - it wouldn't work on the 130XE that was given to me to repair. After several hours of pulling out my hair over this thing (and anyone who has seen my balding pate KNOWS I can't afford to do too much of that!), I determined the problem: the resistor value given - 3000 ohms-- was too low for this machine at least. This value was just slightly above what the computer registered as a key pressed. Any random electrical noise would cause the computer to read the key as pressed, which would cause problems with the BBS program that was being used. A higher resistor value was needed.

There is no "correct" resistor value to use, as it varies between different 130XEs. You may need to do some testing (as I did) to make sure it works properly.

What You Need:

Soldering Iron and Solder
Wire Clippers
3 4700 Ohm Resistors, 1/4 watt
A small Phillips screwdriver
Needle-Nosed Pliers

How to Do It:

- 1) Unplug all of the wires from the computer. Turn the computer over and remove the four screws that hold the top cover on. Turn the computer back over and THEN take off the top cover.
- 2) Lift the keyboard up and forward and you should see the ribbon connector at the lower right corner. Gently remove the ribbon from the connector.
- 3) Remove the screws that hold the motherboard to the lower half of the case. Lift the front part of the motherboard up and then forward to remove it from the case.
- 4) Straighten the tabs that hold the top and bottom shields on and remove the shields.
- 5) Turn the board over with the keyboard connector facing to the front. The connector pins are numbered from right to left. Pin #3 is the ground connection, and Pins #21, 22, and 23 are the pins for START, SELECT, and OPTION keys, respectively. These are the connections you need to make for the repair.
- 6) Take the three resistors and solder the wire from one end of one resistor and solder it to the second resistor at the spot where the wire comes out from the resistor body. Repeat this procedure from the second to the third. You should have the three resistors soldered to one common wire. Cover this wire with a short piece of tubing (known as "spaghetti") or some insulation stripped from a piece of scrap wire. Connect this wire to Pin #3 of the ribbon connector. This is the common connection for the console keys. Solder the other end of each resistor to Pins # 21, 22, and 23 of the connector, being sure to cover them with a short piece of insulation as well.
- 7) Check your wiring to be sure that there are no shorts! Use as little solder as possible and make the connection as fast as you can, using as little heat as possible. Place a short piece of electrical tape on the board under the resistors, if needed, and press the resistors close to the board.
- 8) Reassemble the shields and check to see that the resistors are not shorting against the lower shield.
- 9) Reattach the keyboard to the motherboard, taking care not to bend the ribbon - it WILL crack. It helps to insert one edge first; then, carefully work the other edge into the connector.
- 10) To test the repair, power up the computer and in BASIC type: 10 PRINT PEEK(53279):GOTO 10

Then, type RUN. You should see a vertical row of 7's.

Pressing OPTION will give you 3's, SELECT will give you 5's and START will give you 6's. The value should not change while any one key is held down.

This should return the normal function of the console keys.

Special Note for Techs:

You can use the following method to determine the exact resistor value that you need. It might save you time and aggravation.

What You Need (in addition):

Multitester ("digital" is best)
10K Multiturn Potentiometer
Some short pieces of thin wire

Do the following between steps #4 & #5 of the above procedure:

- A) Connect one short piece of wire to the center pin of the pot; the other to one of the other pins.
- B) Solder the free end of one wire to the ground pin (Pin 3). These connections will only be temporary. Solder the other free end to one of the console key Pins (21, 22, or 23). Adjust the pot for maximum resistance.
- C) Reconnect the power and monitor. Reconnect the keyboard. Turn on the computer with the option key pressed - you should get the diagnostic screen. Select the KEYBOARD TEST and hit START.
- D) Adjust the pot until the tone just starts to sound intermittently. Measure the resistance by connecting the probes to the center pin and the unused pin on the pot. Subtract the measured value from the rated value of the pot to get the proper value. Record it.
- E) Adjust it again until the tone sounds continuously. Record the value the same way as in step d.
- F) Turn the computer off, and disconnect the cables and the keyboard. Unsolder the wires from the keyboard connector.
- G) The proper resistor value to use will be the closest value that is both HIGHER than the highest value recorded, but around DOUBLE the lower value. The resistors you will use will probably be between 3000 and 5000 ohms. Continue on to step #5 as above

If you have any questions about this or any technical questions about Atari 8-bit computers, you can call the AtariTech BBS at (813) 539-8141 or write to:

AtariTech BBS P.O. 7974 Clearwater, Florida 34618.

We have many files on easy to build hardware projects, memory upgrades, fixes, and mods.

Note: Downloaded from GENie
Z-Mag issue #150
Courtesy WISHING WELL BBS
(215) 264-1481

*** SOUND PROGRAMMING ***

COMPUTERS AND MIDI

By: J. D. Craig (LVAUG)

Quickie glossary: Sample - a brief digital recording of a sound. Patch - a synthesized or sampled sound usually called up from memory. Patch Librarian - a system for storing and retrieving patches. Patch Editor - a system for modifying patches. Sequencer - a system for feeding pre-programmed notes, rests, and program changes to a synth or sampler. Copyist or Score Editor - a system for creating, modifying, or printing out traditional musical notation, often from pre-programmed sequences. FX - sound effects; often refers to artificial echoes or reverberation. SMPTE - the Society of Motion Picture and Television Engineers; usually refers to a method standardized by that society for marking and referencing time in audio, video, or film production.

Now, let's get a feel for what's going on in the world of computers and MIDI by browsing through a few magazines. For instance:

From the 6/89 Journal of the Audio Engineering Society - "MIDI and Sound Book for the Atari ST, by Bernd Enders & Wolfgang Klemme, is for Atari ST users and those who want to write Atari music software using MIDI conventions." Book or disk \$17.95 from M&T Books, 501 Galveston Dr., Redwood City, CA 94063. (In a future issue of this newsletter, watch for some highlights from the Audio Engineering Society's 87th Technical Meeting & Exhibits in New York City on October 18th thru 21st).

On the subject of meetings, the Ninth Symposium on Small Computers in the Arts will be held at the Hershey Hotel at Broad & Locust Sts. in Philadelphia, November 2 thru 5th. "The worlds of music, film, video, graphics design, animation, sculpture, and multi-media are presented in talks,

demonstrations, concerts, art exhibits, and video/film/slide shows." For more info, call SCAN 215-923-3299 evenings. Attendance is limited, so register early.

From the 9/89 issue of RE/P (Recording Engineer/Producer) - "In an apparent move to compete with Yamaha's C-1 portable computer, Atari has introduced the Stacy laptop computer," reports Laurel Cash in her "Summer NAMM goodies" article. (The C-1 is renowned for its capability in handling MIDI music, its 11 MIDI ports, and its utility as an IBM-compatible MS-DOS computer). The Stacy is supposedly ST and Mega compatible. Have any of you seen this machine yet? Leave replies on WAREHOUSE (432-3679) or A.C.U.T.E. (261-0620) BBSs, or write in care of this newsletter.

Under New Products in RE/P we find GenEdit from Hybrid Arts; a universal MIDI patch editor and sound librarian for the Atari ST and Macintosh. "A Template Editor lets the user create a virtual control panel for any MIDI instrument, including synthesizers, drum machines, effects devices and mixers." Atari version \$249, Mac version \$349.

From the 11/89 EM (Electronic Musician) - "Musicode offers the K1-VDS Voice Development System (\$89) for the Kawai K1 and Atari ST. The program integrates a graphic editor/librarian with randomize and mix features and a sequencer that supports the standard MIDI file format. Screen and patch data may be printed out, and patches may be selected and edited while a sequence is running." Musicode, 5575 Baltimore Dr., Suite 105-127, La Mesa CA 92042, 619-469-7194.

Also in EM, a favorable review of GenWave by Interval Music Systems, 12077 Wilshire Blvd #515, Los Angeles CA 90025, 213-478-3956. This is a 12 and 16 bit sample editor for about 29 different samplers and the Atari ST or Mega computers. "Simplicity of operation and gracefulness of function are the highlights of this package," reports Editor-in-Chief Craig Anderton. \$349.

Finally from EM, a listing of Atari MIDI music software available in an ad by Leigh's Computers, 1475 3rd Ave., New York City 10028 - "Call 800-321-MIDI": Creator 2.1, Cubase by Steinberg, Dr. T Copyist, Dr. T D-50 Edit/Lib, Dr. T FX-Pac 1, Dr. T Guitaristics, Dr. T KCS 1.7, Dr. T Level II w/MPE, Dr. T M-1 Edit/Lib, Dr. T Proteus Editor, Drumware K1 Editor, EZ Score+, EZ Track+, GenWave Univ. Sample Ed., M by Intelligent Music, M1/D-50 Command, Master Tracks Jr., Master Tracks Pro, MIDIssoft Studio Adv., Notator 2.1, Notator Unitor SMPTE, Omnibanker, Realtime, Sonic Flight D-10/110 Capture, Sound Designer Universal, Steinberg K1 Editor, Steinberg 12, Steinberg Master Score, Steinberg Sequencer Ver. 3, Steinberg Time Lock, Super Librarian, Turbo Synth, and XOR by Dr. T.

Had enough? Me too, until the next issue. If you've had any MIDI experiences you'd like to share with your fellow Atarians, write an article and send it in. Or contact me via the means noted above.

* THE X-COM WEDGE v2.0 *

An Overview of the Wedge, an Extended Command Set Utility for SpartaDOS 3.2d and XL/XE's with at Least 128k of Ram.

By Ed Bachman (LVAUG)

The Wedge is a utility, or actually a whole gaggle of utilities in one package. It performs a range of operations, from viewing arc files, moving files, peeks and pokes, reading files, locating files, to various Sparta-specific functions. But the "icing on the cake" so to speak, is the fact that once installed all these functions become "resident" or internal commands to the Sparta command processor. Better still, the majority of these commands are NOT destructive to memory, unlike most stand alone utilities.

The 1.x series of the Wedge was an attempt at consolidating various utilities, but at an enormous memory cost (hey, you have to put the code somewhere!). Hence, version 2.x of the Wedge, which bumps memlo by less than 200 bytes. This is accomplished by placing the bulk of the code out in extended ram. This requires a system of 128k or more. However, this extra space also allows the wedge to be much more powerful than a stand alone utility. All of the work performed by the Wedge is done in extended ram, effectively, preserving memory in the main bank. This allows for a variety of normally memory destructive tasks to be done, without harming any programs or data in the main bank of memory.

Some Wedge features.....

The Wedge will add 17 "extended" commands to the command processor in sparta 3.2d. It will add an additional three commands, if it finds a Multi I/O on line as well. Here are some of the features the Wedge makes available:

- A "Paged" File Reader
- An Arc/Alf File Viewer
- Hex and Decimal Conversions
- Peeks and Pokes
- Identify Files
- Find Files
- Protected Copy, not Mem Destructive
- Count Files
- Double Column Directories
- Move Files
- Rename Ssubdirs
- Erase Files W/Query

Mio users will also have a resident DSWAP, lock mio drive function, and direct access to the mio menu which does not coldstart the computer, should you have a cart installed.

The Wedge works well under a variety of applications and programming environments; although, it is a resident utility, it can be removed at any time, for programs that require the

extended ram for its own uses. If I sound enthusiastic about the Wedge, it's because I am! I believe you'll find this to be a very useful utility, and after a time, somewhat habit forming. <grin!> The Wedge is shareware, and can be found on BBSs across the country. The most current revision is always available on my support board, the Atari Computer Users Technical Exchange: the ACUTE bbs (215) 261-0620.

Happy Computing! Ed.

Editors' Note: This is a reprint from Z-mag.

* ACTION TUTORIAL #02 *

(Editors' Note: Tutorial #01 was Run in a Previous Issue)

ACTION! and BBS EXPRESS! PRO TUTORIAL

By: Thomas M. Johnson

Available from:

Villa Video's Bargain Cellar
(414) 265-5149
ExpressNet Node X11

Action! is copyrighted by ACS, OSS, ICD.
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This tutorial can be distributed under the following conditions:

- 1) It is free.
- 2) All of the above information is intact.

In the last lesson, we went over how to compile and run the Action! program. We also learned that the last PROC in a program is the first one that is run. Finally, we learned our first Action! library PROC - PrintE.

Now, we are going to cover variables. In Action!, you must know what type of values a variable will take on before you can use it. This is so the compiler can set aside the right amount of space for that variable.

In Action!, we have 3 basic variable types: BYTE, INT and CARD.

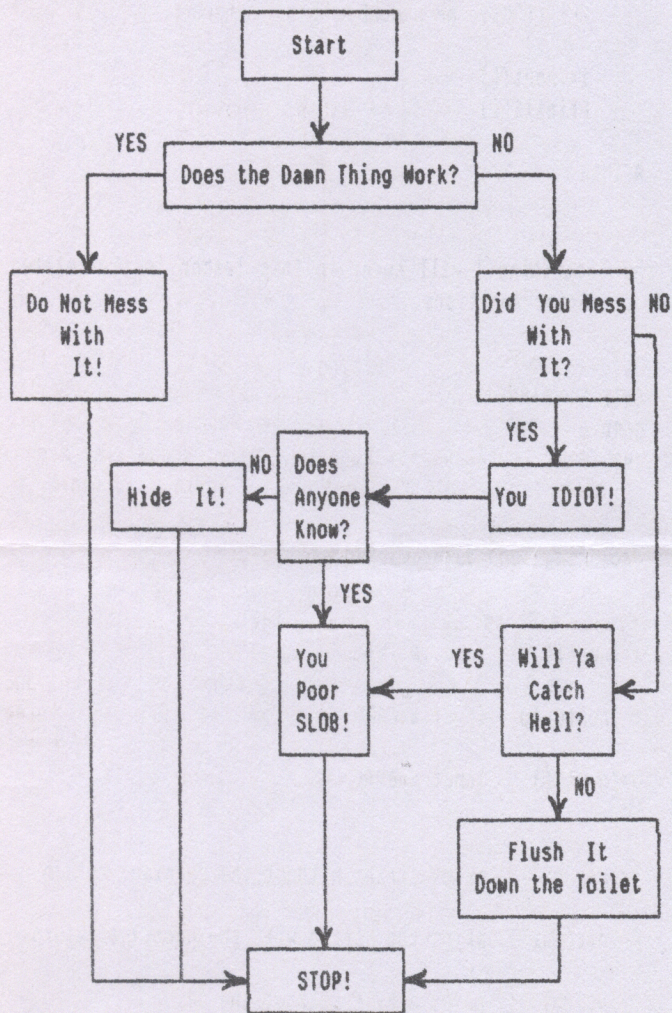
Note: the keywords BYTE and CHAR are identical and can ALWAYS be used in place of each other.

First, the BYTE. A BYTE can have a value from 0 to 255 and that is all. When you add 1 to a BYTE with a value of 255 you get 0. The same when you subtract 1 from 0 you get 255.


BYTE values are used for loops and most other general values.

The next basic type is a INT. INTs can have values from -32768 to 32767. If you need to use negative numbers, a INT is the only way to do it.

Lastly, we have a CARD. CARDS can have values from 0 to 65535. Use CARDS when you need larger numbers. But 65535 is



TROUBLESHOOTING FLOWCHART (LYCG's 9/89 Newsletter "Bit by Bit")



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the largest number you can have. When you add 1 to 65535, you get 0 for an answer.

There are no real numbers like 5.7 in Action!. Nor, is there scientific notation like 5.8E4.

Why does Action! have these restrictions? I know BASIC programmers say "In BASIC, we don't have to declare variables and they can be real and larger than 65535."

But, in BASIC, EVERY variable takes up 6 bytes of memory. In Action!, a BYTE takes up 1 byte and INTs and CARDS take up only 2. And, this is the way the computer really looks at numbers. The floating point package is the thing that, really, slows BASIC down.

So we have this chart:

Name	Size in Bytes	Low Val.	High Val.
BYTE	1	0	255
INT	2	-32768	32767
CARD	2	0	65535

Ok, so, how do you use them? Here is a sample program.

```
PROC main()
```

```
    BYTE i
```

```
    Print("Give me a number")
```

```
    i=InputB()
```

```
    PrintBE(i)
```

```
RETURN
```

The first line, we know, defines a PROC. It is required by the Action! program.

The next line declares "i" and "j" as variables of type BYTE. They will only have values from 0 to 255.

The Print statement prints what is between the quotes without returning the carriage after.

The i=InputB() line inputs a BYTE from the keyboard and places its value in "i."

j=i sets the value of "j" the same as the value of "i."

PrintBE(j) prints the value of "j" as a BYTE and returns the carriage.

If a number larger than 255 is entered, the Action! system will take what is called the "least significant byte" of that number and place that in "i." I won't go into LSB right now but, if you want to experiment...

What, if you wanted INTs instead of BYTES?

```
PROC main()
```

```
    INT i
```

```
    Print("Give me a number")
```

```
    i=InputI()
```

```
    PrintIE(i)
```

```
RETURN
```

OK, the last thing I will cover in this lesson is the related Input and Print functions.

```
BYTE b
```

```
CARD c
```

```
INT i
```

Just declaring some dummy variables.

```
i=InputI()    input a INT
```

```
c=InputC()    input a CARD
```

```
b=InputB()    input a BYTE
```

```
Print("hi")    print string without the carriage return
```

```
PrintE("hi")    print the string with the carriage return
```

```
PrintB(b)       print a BYTE without the CR
```

```
PrintBE(b)      print a BYTE with a CR
```

```
PrintC(c)       print a CARD without a CR
```

```
PrintCE(c)      print a CARD with a CR
```

```
PrintI(i)       print a INT without a carriage return
```

```
PrintIE(i)      print a INT with a CR
```

Next time, we will go into expressions and the IF statement.

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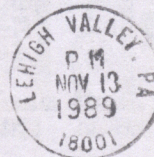
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